MANUAL SNOWPLOW WITH A WOODEN BLADE

Background

The present invention relates to a device used for snow removal. In particular, the present invention relates to a snowplowing device having a blade of sufficient size and design to allow efficient and inexpensive snow removal.

Manual snow shovels are a familiar means for removing snow from driveways and walkways. However, shoveling can become cumbersome and inefficient as the surface to be shoveled reaches proportions greater than that of a conventional sidewalk. For example, the repetitive scooping actions associated with shoveling snow can become fatiguing and time consuming. In this manner, strength and endurance limitations play a large role in the effectiveness of manual shoveling.

Another readily recognizable solution to snow removal is a powered snow-removing machine more commonly known as a "snow blower." While snow blowers solve many of the problems associated with removing snow from larger areas, problems remain. For example, snow blowers present a significant investment in purchase price, storage, and maintenance. Additionally, many snow blowers work poorly in lighter snowfalls and are simply inappropriate for snowfalls of approximately four and one-half inches or less.

A possible alternative to conventional shovels or snow blowers is a manual snow-pushing tool (hereinafter referred to as a "manual snowplowing device.") The manual snowplowing devices described in U.S. Patent Nos. 4,597,204; 5,309,654; and 6,237,258 B1 reference potential advantages over shovels and snow blowers by allowing a user to impart a sliding motion on a plow blade when removing snow. One advantage arises as pushing or sliding alleviates the need for the repetitive lifting actions associated with shoveling. An advantage over snow blowers lies in the ability to effectively remove snow associated with lighter snowfalls without the consequential cost and efforts associated with powered snow blowers. Unfortunately, known manual snowplowing devices have several deficiencies. For example, the prior manual

snowplowing devices have blades that are either inadequately sized or insufficiently rigid to effectively and efficiently remove snow from larger surfaces. Yet another problem associated with manual snowplowing devices of prior design is the complexity of the steps and corresponding number of parts needed for assembly.

In sum, a need exists for a push-type, manual snowplowing device with a blade of adequate size and structure to efficiently remove snowfalls of four and one-half inches or less. That need encompasses a tool avoiding the physical strain associated with shoveling while remaining cost effective, relatively maintenance free, and amenable to storage and user assembly.

Brief Description of the Drawings

The invention will be further described with reference to the drawing wherein corresponding reference characters indicate corresponding parts throughout the several views of the drawing, and wherein:

FIG. 1 illustrates a front perspective view of a manual snowplowing device in accordance with the present invention.

FIG. 2 shows an exploded side view of manual snowplowing device of FIG. 1.

FIG. 3. details a back perspective view of the manual snowplowing device of FIG. 1.

FIG. 4 shows an alternative manual snowplowing device in accordance with the present invention.

Detailed Description

In the following Detailed Description, reference is made to the accompanying drawings, which form a part hereof. The drawings show specific embodiments in which the invention may be practiced by way of illustration. In this regard, directional terminology, such as "top," "bottom," "front," "back," "leading," "trailing," etc., is used with reference to the orientation of the FIGS. being described. Because components of embodiments of the present invention can be positioned in a number of different orientations, the directional

terminology is used for purposes of illustration and is in no way limiting. It is to be understood that other embodiments may be utilized and structural or logical changes may be made without departing from the scope of the present invention. Therefore, the following detailed description is not to be taken in a limiting sense as the scope of the present invention is to be defined by the appended claims.

A preferred embodiment of a manual snowplowing device 10 in accordance with the present invention is shown in FIG. 1. The manual snowplowing device 10 includes a rigid wooden blade 12, a coupling device 14, and a handle 16. The elements of the snow plowing device 10 and their interrelation will be described in greater detail below. However, the named elements are generally related wherein the handle 16 is securely mounted within the coupling device 14, which is in turn secured to the wooden blade 12. The basic mode of operating the manual snowplowing device 10 generally includes a user (not shown) imparting a sliding force on the handle 16, which is then translated through the coupling device 14 to the wooden blade 12. In this manner, the blade 12 is used to push a mass of snow corresponding to a length of the blade 12.

With additional reference to FIG. 2, the wooden blade 12 defines a front face 18, a back face 20, a top side 22, and a bottom side 24. As previously alluded to, the front face 18 of the blade 12 serves as a plowing surface, wherein the front face 18 contacts and pushes the snow to be removed from a surface. In order to effectively remove snow, it is preferable that the blade 12 be configured to resist deflection or flexure during plowing, especially when plowing relatively large amounts of snow. Excessive flexure of the blade 12 results in structural fatigue or failure and less consistent plowing passes. It is well known that the deflection of a generally rigid member is partially a function of the elastic modulus of the material, the load applied, the total length of the member, and the cross-sectional area of the member. It has surprisingly been found that wood products of appropriate dimensions will serve to provide a sufficiently rigid blade 12 at a low cost and at high availability. Wood products and materials are often supplied in rectangular planks or boards. As a result, in a preferred

embodiment, the wooden blade 12, and thus the front face 18 and the back face 20 of the wooden blade 12 are generally rectangular in shape and define a thickness of the wooden blade 12 selected to ensure sufficient structural rigidity. In a preferred embodiment, the blade 12 forms a plurality of holes 23 for accepting a plurality of bolts 25 or other similar fastener means as described below.

In the preferred embodiment, the blade 12 is formed of pine and has a length of not less than 36 inches, more preferably in the range of 36 – 54 inches, more preferably in the range of 40 – 50 inches, and even more preferably 48 inches in order to provide a sufficiently wide plow path. The blade 12 has a thickness in the range of 3/8 – 6/8 inch, more preferably 5/8 inch and a height of not less than 4.5 inches, more preferably in the range of 5 - 6 inches, more preferably 5.5 inches. While the preferred embodiment incorporates the materials and dimensions described above, it is notable that a number of different wood types can be combined with varying thicknesses and heights to provide sufficient blade rigidity at a particular length and load. The wood types include, but are not limited to, pine, oak, particleboard, cedar, and treated lumber. By choosing a relatively thick wood product for the blade 12, the resultant manual snowplowing device 10 is relatively light weight, yet the blade 12 remains rigid under load and thus allows use of a relatively small coupling device 14, as described below. To this end, it has surprisingly been found that forming the blade 12 of pine having a length of 48 inches, a thickness of 5/8 inch and a height of 5.5 inches provides an optimal balance between available plowing surface area, necessary rigidity, and weight.

The coupling device 14 of the manual snowplowing device 10 is illustrated in greater detail in FIG. 2. In one embodiment, the coupling device 14 includes a metal faceplate 26 and a metal sleeve 28. The metal faceplate 26 defines a front face 30 and a back face 32, which combine to define a shape and a corresponding thickness. In a preferred embodiment, the front face 30 is generally planar, which as will be described in greater detail below, serves to aid attaching of the metal faceplate 26 to the wooden blade 12. Material economy should be emphasized to promote cost effectiveness, transportability, and ease of

assembly. As previously mentioned, the rigidity of the wooden blade 12 allows a relatively small metal faceplate 26 while still ensuring the necessary structural support to the snowplowing device 10 during snow removal. As such, with the preferred embodiment of FIG. 2, the faceplate 26 defines a generally rectangular shape having a longest dimension not more than one-quarter a length of the wooden blade 12. More preferably, a longest dimension of the faceplate is not more than one-sixth the length of the wooden blade 12. Additionally, the faceplate 26 can include a plurality of holes 33 for accepting bolts or other fasteners well known in the art to facilitate assembly of the snowplowing device 10.

The metal faceplate 26 can be formed of a wide variety of metals including, but not limited to, aluminum, stainless steel, cast iron, and other related alloys. For example, in a preferred embodiment, the metal faceplate 26 is formed of stainless steel and defines a generally rectangular shape having a length of not more than 9 inches, more preferably in the range of 5 – 9 inches, more preferably in the range of 6 – 8 inches, and most preferably approximately 7 inches, and a thickness of approximately 0.25 inch. With the embodiment shown in FIG. 2, the metal faceplate 26 also includes four holes 33 (two of which are shown in FIG. 2) generally located at the corners of the metal faceplate 26. While the metal faceplate 26 has been described as defining a generally rectangular shape, the faceplate 26 can take a variety of shapes as is discussed further below in association with alternative embodiments.

In the preferred embodiment shown in FIG. 2, the metal sleeve 28 is immovably welded to the faceplate 26, having a first end 34 welded to the faceplate 26 and having a terminal end 36 extending angularly relative to the back face 32 of the faceplate 26. In the embodiment of FIG. 2, the metal sleeve 28 defines a tubular shape extending linearly from the back face 32 of the metal faceplate 26. However, the metal sleeve 28 can extend to define a variety of shapes including arcs, multiple angles, or combinations thereof. The sleeve 28 may also include a plurality of holes for accepting bolts or other similar fasteners.

The metal sleeve 28 can also be formed of a wide variety of metals including, but not limited to, aluminum, stainless steel, cast iron, and other related alloys. For example, in a preferred embodiment, the metal sleeve 28 is formed of stainless steel and defines a generally linear and tubular shape. In the embodiment of FIG. 2, the terminal end 36 defines a face generally perpendicular to a central axis of the metal sleeve 28, while the first end 34 defines a face cut at an angle of approximately 35 degrees relative to the central axis of the metal sleeve 28. With the embodiment of FIG. 2, the sleeve 28 includes a hole 37 for accepting a bolt 41 or the like. Additionally, the metal sleeve 28 preferably has a length in the range of 4-6 inches to ensure sufficient surface area contact with the handle 12 (FIG. 1) as described below.

Returning to FIG. 1, the handle 16 of the manual snowplowing device 10 includes a generally solid, cylindrical shaft 17 defining a length and a diameter. As is shown more clearly in FIG. 2, the handle 16 includes a distal section 38, which is sized for insertion into the metal sleeve 28 of the coupling device 14. In a preferred embodiment, the distal section 38 includes at least one hole 39 for accepting the bolt 41 or other fastener. In another preferred embodiment, the distal section 38 of the handle 16 further includes a thin metal jacket 40 received over the shaft 17, which also includes the hole 39 for accepting the bolt 41 or other fastener.

The shaft 17 can be formed of a wide variety of materials including, but not limited to, woods, metals, plastics, fiberglass, or other composites. The handle 16 can also include loops or grasps at an end opposite the distal section 38 or multiple diameters or bends to promote the ergonomics of the handle 16. Regardless, the handle 16 has an overall length sufficient to permit a user to stand while plowing snow with the device 10, for example not less than 4 feet in length.

With reference to FIGS. 2 and 3, the manual snowplowing device 10 may be assembled and utilized to plow snow in the following manner. In a preferred embodiment, a rigid connection is made between the faceplate 26 of the coupling device 14 and the wooden blade 12 via the plurality of bolts 25 running through the plurality of holes 23 (FIG. 2) in the wooden blade 12 and the corresponding

plurality of holes 33 in the metal faceplate 26 (FIG. 2). The blade 12 and the faceplate 26 are preferably arranged relative to one another such that the generally planar back face 20 of the blade 12 is flush with the generally planar front face 30 (FIG. 2) of the faceplate 26. As the metal sleeve 28 of the coupling device 14 is rigidly welded to the metal faceplate 26, it follows that the entire coupling device 14, including the metal sleeve 28, is thereby rigidly affixed to the wooden blade 12.

With the embodiment of FIG. 3, the distal section 38 of the handle 16 is disposed within the metal sleeve 28 of the coupling device 14 via the terminal end 36. In one embodiment, the distal section 38 is rigidly secured within the metal sleeve 28 by the bolt 41 running through the hole 37 in the metal sleeve 28 and the corresponding hole 39 in the distal section 38 (FIG. 2). However, a wide variety of other means can be employed to secure the distal section 38 within the sleeve 28. For example, in another preferred embodiment, the distal section 38 is glued within the sleeve 28. In another embodiment, the distal section 38 is screwed into the sleeve 28 via corresponding threads formed on the handle 16 and the metal sleeve 28. Regardless of the securing means employed, once the handle 16 is rigidly secured within the sleeve 28, both the handle 16 and the terminal end 36 of the sleeve 28 extend at an angle relative to the back face 32 of the metal faceplate 26. In accordance with this relationship, the handle 16 extends at an acute push angle θ_p, preferably in the range of 40 – 45 degrees, relative to a vertical plane of the wooden blade 12. In this manner, a user may stand generally upright an impart a push force F_p on the handle 16 while at the same time the wooden blade 12 is generally perpendicular to a snow covered surface 42 to be plowed.

A preferred method of plowing snow utilizing the manual snowplowing device 10 of the present invention can be described with reference to FIG. 3. In a preferred embodiment, the bottom side 24 (referenced generally in FIG. 3) of the wooden blade 12 is forced to contact the snow covered surface 42. A user can then impart the plow force F_p on the handle 16, which is generally parallel to the snow-covered surface 42 and consequently transferred to the wooden blade

12 via the coupling device 14. Upon imparting the force F_p, the front face 18 (FIG. 1) of the wooden blade 12 will thereby contact and push a mass of snow.

The preferred method also includes a means of extending the life of the blade 12. As the blade 12 is repeatedly slid across the snow covered surface 42, the bottom side 24 of the blade 16 can become worn and irregular. Therefore, a preferred method of plowing snow following extended blade use includes unbolting the wooden blade 12 from the faceplate 26 and rotating the wooden blade 12 one hundred and eighty degrees such that the bottom side 24 of the blade 12 is situated opposite its position prior to rotation. Thus, the top side 22 of the blade 12 becomes the side that is to contact the snow covered surface 42. In this manner, first the bottom side 24 and then the top side 22 the wooden blade 12 are slid across the snow covered surface 42 until becoming too worn, thereby doubling the life of the blade 12.

The snowplowing device 10 of the present invention can also be supplied to retailers and consumers for later assembly. As a result, the wooden blade 12, the coupling device 14, and the handle 16 can be supplied in an unassembled state as a "kit of parts." In one preferred embodiment, directions for assembling the snowplowing device 10 are also included in the kit of parts. By supplying the components of the snowplowing device 10 as a kit, the wooden blade 12 of the present invention can be of a greater length than snow plows of prior designs while remaining amenable to shipping and transportation. Additionally, the small number of parts used to assemble the snowplowing device 10 encourages facile and timely assembly.

As various changes could be made in the above constructions and methods without departing from the scope of the dimension as defined in the claims, it is intended that all matter contained in the description or shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense. As such, several alternative embodiments are included within the scope of the present invention. For example, an alternative embodiment manual snowplowing device 210 comprising a wooden blade 212, a coupling device 214 and a handle 216 is shown in FIG. 4.

With the alternative embodiment of FIG. 4, and as described in association with the preferred embodiments above, the coupling device 214 generally includes a metal faceplate 226 and a metal sleeve 238. However, the metal faceplate 226 of the alternative embodiment includes a front face 230 (not shown) and a back face 232, generally triangular in shape. Additionally, the metal faceplate 226 includes a plurality of holes (hidden in FIG. 4) for accepting a plurality of bolts 225 or similar fasteners that are located at the corners of the triangular faceplate 226.

In the alternative embodiment of FIG. 4, the metal sleeve 228 is immovably welded to the faceplate 226, having a first end 234 welded to the faceplate 226 and having a terminal end 236 extending angularly relative to the back face 32 of the faceplate 226. In contrast to the preferred embodiments described above, the metal sleeve 228 defines a tube extending through an arcuate shape of a radius R from the back face 232 of the metal faceplate 226. Additionally, the metal sleeve 228 of the snowplowing device 210 includes a series of female threads 244 at the terminal end 236. In the alternative embodiment, a distal end 238 of the handle 216 also includes a series of threads 246 mated with a series of threads 244 included in the metal sleeve 228 rigidly securing the distal end 238 within the sleeve 228.

By at least the above stated means, the present invention embodies a snow plowing device and method of plowing snow that utilizes a wooden blade of adequate size and structure to effectively remove snowfalls of four and one-half inches or less. Moreover, the present invention embodies a tool avoiding the physical strain associated with shoveling while remaining cost effective, relatively maintenance free, and amenable to storage and user assembly.

Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or equivalent implementations may be substituted for the specific embodiments shown and described without departing from the scope of the present invention. This application is intended to cover any adaptations or variations of the specific embodiments discussed herein. Therefore, it is

intended that this invention be limited only by the claims and the equivalents thereof.